

PAPER – 2 : MANAGEMENT ACCOUNTING AND FINANCIAL ANALYSIS

QUESTIONS

Netting of Foreign Exchange liabilities

1. Trueview plc, a group of companies controlled from the United Kingdom includes subsidiaries in India, Malaysia and the United States. As per the CFO's forecast that, at the end of the June 2010 the position of inter-company indebtedness will be as follows:
 - The Indian subsidiary will be owed Rs. 1,44,38,100 by the Malaysian subsidiary and will owe the US subsidiary US\$ 1,06,007.
 - The Malaysian subsidiary will be owed MYR 14,43,800 by the US subsidiary and will owe it US\$ 80,000.

Suppose you are head of central treasury department of the group and you are required to net off inter-company balances as far as possible and to issue instructions for settlement of the net balances.

For this purpose, the relevant exchange rates may be assumed in terms of £ 1 are US\$ 1.415; MYR 10.215; Rs. 68.10.

What are the net payments to be made in respect of the above balances?

Foreign Exchange Risk Management

2. Somu Electronics imported goods from Japan on July 1st 2009, of JP ¥ 1 million, to be paid on 31st, December 2009. The treasury manager collected the following exchange rates on July 01, 2009 from the bank.

Delhi Rs./US\$ Spot	45.86 /88
6 months forward	46.00/03
Tokyo JP ¥/ US\$ Spot	108/108.50
6 months forward	110/110.60

In spite of fact that the forward quotation for JP ¥ was available through cross currency rates, Mr. X, the treasury manager purchased spot US\$ and converted US\$ into JP ¥ in Tokyo using 6 months forward rate.

However, on 31st December, 2009 Rs./US\$ spot rate turned out to be 46.24 /26.

You are **required** to calculate the loss or gain in the strategy adopted by Mr. X by comparing the notional cash flow involved in the forward cover for Yen with the actual cash flow of the transaction.

3. An automobile company in Gujarat exports its goods to Singapore at a price of SG\$ 500 per unit. The company also imports components from Italy and the cost of components for each unit is € 200. The company's CEO executed an agreement for the supply of 20000 units on January 01, 2010 and on the same date paid for the imported components. The company's variable cost of producing per unit is Rs. 1,250 and the allocable fixed costs of the company are Rs. 1,00,00,000.

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The exchange rates as on 1 January 2010 were as follows-

Spot	Rs./SG\$	33.00/33.04
	Rs./€	56.49/56.56

Mr. A, the treasury manager of company is observing the movements of exchange rates on a day to day basis and has expected that the rupee would appreciate against SG\$ and would depreciate against €.

As per his estimates the following are expected rates for 30th June 2010.

Spot	Rs./SG\$	32.15/32.21
	Rs./€	57.27/57.32

You are **required** to find out:

- (a) The change in profitability due to transaction exposure for the contract entered into.
- (b) How many units should the company increase its sales in order to maintain the current profit level for the proposed contract in the end of June 2010.

Capital Budgeting with Inflation

4. In the end of the year 2009, Ms. Diana, Marketing Head of Zagreb Corporation discussed her idea of introducing a new cosmetic product in the market with Mr. Cable, CEO of the Corporation from the year 2010.

It is proposed that the product would be directly purchased from outside suppliers and sold in the market through the corporation's chain stores in a specialised containers.

Initial Capital investment required for packing machine shall be €1 million to be made in the year 2009 itself. Further this capital investment will have a ten-year operating life and five year life for tax purposes.

In addition to capital investment inventory amounting €0.50 million need to be purchased in year 2009. The purchased inventory will be sold for cash one year after the purchase for €1 million at 2009 prices and replaced immediately.

Other operating cost excluding depreciation is expected to €2,00,000 per year at 2009 prices.

It is expected that 6% inflation is expected in the country and it is expected that, inventory cost, sale price and operating costs are expected to increase as per inflation rate.

You as a financial consultant is required to determine whether project should be accepted or not. Main assumptions for analysis are as follows:

- (i) The cost of capital is 12%.
- (ii) Tax rate is 34%.
- (iii) The residual value of investment is Nil.

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- (iv) Depreciation to be provided on straight line basis starting from the year of purchase of machinery.

Capital Budgeting with Risk

5. STW Publishing House, a small publisher is publishing economy edition of a new book on Financial Management. The cost of typesetting and other related cost will be Rs. 1,00,000. The cost of printing per book will be Rs. 20. If additional books are needed at a later time, the setup cost will be Rs. 50,000 per setup, however, cost of printing the book shall remain the same.

The book will be sold for Rs. 140 per copy. Royalty to author, commission of agent and other related delivery charges shall be Rs. 40 per book.

The future sale of book depends upon the review of the book. In case book gets good review, it is expected that sale of book will 5000 copies per year for three years. On the other hand, if it gets bad review, the sale will be 2000 copies in the first year and then sale will be ceased.

Probability for good review is 0.3. Mr. X, owner of publishing house faces a choice between ordering an immediate production of 15000 copies or 5000 copies, followed by additional production run at the end of the first year if the book is successful. The cost of capital is 10%

Using Decision Tree analysis recommend production schedule and decide whether book should be published or not.

International Capital Budgeting

6. OJ Ltd. Is a supplier of leather goods to retailers in the UK and other Western European countries. The company is considering entering into a joint venture with a manufacturer in South America. The two companies will each own 50 per cent of the limited liability company JV(SA) and will share profits equally . £ 450,000 of the initial capital is being provided by OJ Ltd. and the equivalent in South American dollars (SA\$) is being provided by the foreign partner. The managers of the joint venture expect the following net operating cash flows, which are in nominal terms:

	SA\$ 000	Forward Rates of exchange to the £ Sterling
Year 1	4,250	10
Year 2	6,500	15
Year 3	8,350	21

For tax reasons JV(SV) the company to be formed specifically for the joint venture, will be registered in South America.

Ignore taxation in your calculations.

Assuming you are a financial adviser and retained by OJ Limited to advise on the proposed joint venture.

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- (i) Calculate the NPV of the project under the two assumptions explained below. Use a discount rate of 16 per cent for both assumptions.

Assumption 1: The South American country has exchange controls which prohibit the payment of dividends above 50 per cent of the annual cash flows for the first three years of the project. The accumulated balance can be repatriated at the end of the third year.

Assumption 2: The government of the South American country is considering removing exchange controls and restriction on repatriation of profits. If this happens all cash flows will be distributed as dividends to the partner companies at the end of each year.

- (ii) Comment briefly on whether or not the joint venture should proceed based solely on these calculations.

Economic Value Added (EVA) Valuation

7. From the following data compute the value of business using EVA method.

	Current Period	Projected Periods	
	2010	2011	2012
Total Invested Capital	Rs. 90,00,000	Rs. 1,00,00,000	Rs. 1,10,00,000
Adjusted NOPAT	Rs. 12,60,000	Rs. 14,00,000	Rs. 16,00,000
WACC	8.42%		

Capital Growth (g) is projected = 6.5% per year after 2012.

Merger and Acquisition

8. The total value (equity + debt) of two companies, A Ltd. and B Ltd. are expected to fluctuate according to the state of the economy

State of the economy	Probability	Value of A Ltd. Rs. in lakh	Value of B Ltd. Rs. in lakh
Rapid growth	0.30	720	1150
Slow growth	0.50	520	750
Recession	0.20	380	600

A Ltd. and B Ltd. currently have a debt of Rs. 420 lakhs and Rs. 80 lakhs, respectively.

The two companies are deciding for merger. Assuming that no operational synergy is expected as a result of the merger, you are required to calculate the expected value of debt and equity of the merged company.

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Also explain the reasons for any difference that exists from the expected values of debt and equity, if they do not change.

9. AB Ltd. is a firm of recruitment and selection consultants. It has been providing consultancy for 10 years and obtained a stock market listing 4 years ago. It has pursued a policy of aggressive growth and specializes in providing services to companies in high-technology and high growth sectors. It is all-equity financed by ordinary share capital of Rs. 500 lakh in shares of Rs. 20 nominal (or par) value.

The company's results to the end of March 2009 have just been announced. Profits before tax were Rs.1,266 lakh. The Chairman's statement included a forecast that earnings might be expected to rise by 4%, which is a lower annual rate than in recent years. This is blamed on economic factors that have had a particularly adverse effect on information technology companies.

YZ Ltd. is in the same business but has been established much longer. It serves more traditional service sectors and its earnings record has been erratic. Press comment has frequently blamed this on poor management and the company's shares have been out of favour with the stock market for some time. Its current earnings growth forecast is also 4% for the foreseeable future. YZ Ltd. has an issued ordinary share capital of Rs.1800 lakh in Rs.100 shares. Pre-tax profits for the year to 31 March 2009 were Rs.1,125 lakh.

AB Ltd. has recently approached the shareholders of YZ Ltd. with a bid of 5 new shares in AB Ltd. for every 6 YZ Ltd. shares. There is a cash alternative of Rs. 345 per share. Following the announcement of the bid, the market price of AB Ltd. shares fell 10% while the price of YZ Ltd. shares rose 14%. The P/E ratio and dividend yield for AB Ltd. and YZ Ltd. immediately prior to the bid announcement are shown below.

2009

High	Low	Company	P/E	Dividend yield %
425	325	AB Ltd.	11	2.4
350	285	YZ Ltd.	7	3.1

Both AB Ltd. and YZ Ltd. pay tax at 30%.

AB Ltd.'s post-tax cost of equity capital is estimated at 13% per annum and YZ Ltd.'s at 11% per annum.

Assuming that you are a shareholder in YZ Ltd. You have a large, but not controlling interest.

You bought the shares some years ago and have been very disappointed with their performance. Based on the information and merger terms available, plus appropriate assumptions, to forecast post-merger values, evaluate whether the proposed share-for-share offer is likely to be beneficial to shareholders in both AB Ltd. and YZ Ltd. Also identify why the price of share of AB Ltd. fell following the announcement of bid.

Note: As a benchmark, you should then value the two companies AB Ltd. and YZ Ltd. using the constant growth form of the dividend valuation model.

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Business Valuation

10. Using the chop-shop approach (or Break-up value approach), assign a value for Cornett GMBH. whose stock is currently trading at a total market price of €4 million. For Cornett, the accounting data set forth three business segments: consumer wholesale, specialty services, and assorted centers. Data for the firm's three segments are as follows:

BUSINESS SEGMENT	Segment Sales	Segment Assets	Segment Income
Consumer wholesale	€1,500,000	€ 750,000	€100,000
Specialty services	€800,000	€700,000	€150,000
Assorted centers	€2,000,000	€3,000,000	€600,000

Industry data for "pure-play" firms have been compiled and are summarized as follows:

BUSINESS SEGMENT	Capitalization/Sales	Capitalization/Assets	Capitalization/Operating Income
Consumer wholesale	0.75	0.60	10.00
Specialty services	1.10	0.90	7.00
Assorted centers	1.00	0.60	6.00

11. ABC (India) Ltd., a market leader in printing industry, is planning to diversify into defense equipment businesses that have recently been partially opened up by the GOI for private sector. In the meanwhile, the CEO of the company wants to get his company valued by a leading consultants, as he is not satisfied with the current market price of his scrip.

He approached consultant with a request to take up valuation of his company with the following data for the year ended 2009:

Share Price	Rs. 66 per share
Outstanding debt	1934 lakh
Number of outstanding shares	75 lakh
Net income	17.2 lakh
EBIT	245 lakh
Interest expenses	218.125 lakh
Capital expenditure	234.4 lakh
Depreciation	234.4 lakh
Working capital	44 lakh
Growth rate 8% (from 2010 to 2014)	

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Growth rate 6% (beyond 2014)

Free cash flow 240.336 lakh (year 2014 onwards)

The capital expenditure is expected to be equally offset by depreciation in future and the debt is expected to decline by 30% by 2014.

Required:

Estimate the value of the company and ascertain whether the ruling market price is undervalued as felt by the CEO based on the foregoing data. Assume that the cost of equity is 16%, and 30% of debt repayment is made in the year 2014.

Option Valuation

12. X Ltd.'s share is currently trading at Rs. 220. It is expected that in six months some it could double or halved (equivalent to a $\sigma=98\%$). One year call option on X Ltd.'s share has an exercise price of Rs. 165. Assuming risk free rate of interest to be 20%, calculate.
- (a) Value of call option on X Ltd's share.
 - (b) Option Delta for the second six month, in case stock price rises to Rs. 440 or falls to Rs. 110.
 - (c) Now suppose in 6 months the share price is Rs. 110. How at this point we can replicate portfolio of call options and risk-free lending.

Dividend Policy

13. The Digital Electronic System Corporation (DESC) pays no cash dividends currently and is not expected to for the next five years. Its latest EPS was ₹10, all of which was reinvested in the company.
- The firm's expected ROE for the next five years is expected to be 20% per year, and during this time it is also expected to continue to reinvest all of its earnings. It is expected that starting six years from now the DESC's ROE on new investments is expected to fall to 15%, and it is expected that the corporation shall start paying out 40% of its earnings in form of cash dividends, which it will continue to do forever after. DESC's market capitalization rate is 15% per year.
- (a) Using DDM model, what is the value of DESC's share today?
 - (b) Now suppose that the current market price of share is equal to as computed in (a) above, then what do you expect to happen to its price over the next year? The year after?
 - (c) If you are expecting that DESC to pay out only 20% of earning starting in year 6 then how your estimates will be effected.
14. In December 2009 International Paper Packing (IPP)'s share sold for about ₹73. As per security analysts forecast a long-term earnings growth rate of 8.5% is expected. IPP is expected to pay dividends of ₹1.68 per share.

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- (a) Assuming that dividends are expected to grow along with earnings at 8.5% per year in perpetuity. What rate of return that an investor can expect to earn?
- (b) It is expected that IPP to earn about 12% on book equity and shall retain about 50% of earnings. How these forecasts will change growth rate (g) and cost of equity (K_e)?

Mutual Fund

15. Mr. X, an investor purchased 200 units of ABC Mutual Fund at rate of Rs. 8.50 p.u., one year ago. Over the year Mr. X received Rs. 0.90 as dividend and had received a capital gains distribution of Rs. 0.75 per unit.

You are required to find out:

Mr. X's holding period return assuming that this no load fund has a NAV of Rs. 9.10 as on today.

Mr. X's holding period return, assuming all the dividends and capital gains distributions are reinvested into additional units as at average price of Rs. 8.75 per unit.

16. Following is the historical performance information is available of the capital market and a Tomplan Mutual Fund.

Year	Tomplan Mutual Fund Beta	Tomplan Mutual Fund return %	Return on market index %	Return on Govt. securities %
2001	0.90	-3.00	-8.50	6.50
2002	0.95	1.50	4.00	6.50
2003	0.95	18.00	14.00	6.00
2004	1.00	22.00	18.50	6.00
2005	1.00	10.00	5.70	5.75
2006	0.90	7.00	1.20	5.75
2007	0.80	18.00	16.00	6.00
2008	0.75	24.00	18.00	5.50
2009	0.75	15.00	10.00	5.50
2010	0.70	-2.00	8.00	6.00

- (a) From above information you are required to calculate the following risk adjusted return measures for the measures for the Tomplan:
 - (i) Reward-to-variability ratio
 - (ii) Reward-to-volatility ratio
- (b) Comment on the mutual fund's performance.

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Leasing

17. The following data is related to the C-Max Leasing Inc. :

Investment cost	\$5 Million
Primary lease term	5 years
Estimated residual value after the primary period	Nil
Pre-tax required rate of return	24%

The C-Max seeks your help in determining the annual lease rentals under the following rental structures:

- (a) Equated,
- (b) Stepped (an annual increase of 15 per cent),
- (c) Deferred (2 years deferment period).

You are required to compute the relevant annual lease rentals.

Portfolio Management

18. Suppose that in the universe of available risky securities contains a large number of shares two stocks, identically distributed with $E(r) = 15\%$, or $\sigma = 60\%$, and with a common correlation coefficient of $\rho = 0.5$.
- a. What is the expected return and standard deviation of an equally weighted risky portfolio of 25 stocks?
 - b. What is the smallest number of stocks necessary to generate an efficient portfolio with a standard deviation equal to or smaller than 43%?
 - c. What is the systematic risk in this security universe?
 - d. If T-bills are available and yield 10%, what is the slope of the CAL?

Security Analysis (Right Issue)

19. Monopolo Ltd. has a paid-up ordinary share capital of Rs. 2,00,00,000 represented by 4,00,000 shares of Rs. 50 each. Earnings after tax in the most recent year were Rs. 75,00,000 of which Rs. 25,00,000 was distributed as dividend. The current price/earnings ratio of these shares, as normally reported in the financial press, is 8.

The company is planning a major investment that will cost Rs. 2,02,50,000 and is expected to produce additional after tax earnings over the foreseeable future at the rate of 15% on the amount invested.

It was proposed by CFO of company to raise necessary finance by a rights issue to the existing shareholders at a price 25% below the current market price of the company's shares.

- (a) You have been appointed as financial consultant of the company and are required to calculate:
 - (i) The current market price of the shares already in issue;

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- (ii) The price at which the rights issue will be made;
 - (iii) The number of new shares that will be issued;
 - (iv) The price at which the shares of the entity should theoretically be quoted on completion of the rights issue (i.e. the 'ex-rights price'), assuming no incidental costs and that the market accepts the entity's forecast of incremental earnings.
- (b) It has been said that, provided the required amount of money is raised and that the market is made aware of the earning power of the new investment, the financial position of existing shareholders should be the same whether or not they decide to subscribe for the rights they are offered.
- You are required to illustrate that there will be no change in the existing shareholder's wealth.*

Bond Valuation

20. NewChem Corporation has issued a fully convertible 10% debenture of Rs. 10,000 face value, convertible into 20 equity shares. The current market price of the debenture is Rs. 10,800, whereas the current market price of equity share price is Rs. 480.

You are required to calculate (i) the conversion premium and (ii) the conversion value.

Swap

21. TMC Corporation entered into €3.5 million notional principal interest rate swap agreement. As per the agreement TMC is to pay a fixed rate and to receive a floating rate of LIBOR.

The Payment will be made at the interval of 90 days for one year and it will be based on the adjustment factor 90/360. The term structure of LIBOR on the date of agreement is as follows:

Days	Rate (%)
90	7.00
180	7.25
270	7.45
360	7.55

You are required to calculate fixed rate on the swap and first net payment on the swap.

Efficient Market Hypothesis

22. The directors of Denter Inc wish to make an equity issue to finance an \$8m expansion scheme, which has an expected net present value of \$1.1m, and to re-finance an existing \$5m 15% Bond that is due for maturity in 5 years' time. For early redemption of these bonds there is a \$350,000 penalty charge. The company has obtained approval from its shareholders to suspend their pre-emptive rights and for the entity to make a \$15m placement of shares which will be at the price of 185¢ per share.

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It is estimated that the floatation cost of the issue to be 4% of gross proceeds. Any surplus funds from the issue will be invested in IDRs, which is currently yielding 9% per year.

As on date the capital structure of Denter Inc is as follows:

	\$'000
Ordinary shares (25¢ per share)	8,000
Share premium	11,200
Free reserves	<u>23,100</u>
	42,300
15% term Bonds	5,000
11% debenture 2009-2012	<u>9,000</u>
	<u>56,300</u>

The entity's current share price is 190¢, and debenture price \$102. Denter can raise debenture or medium-term bank finance at 10% per year.

Assuming stock market to be semi-strong form efficient and no information about the proposed uses of funds from the issue has been made available to the public, you are required to estimate Denter's expected share price once full details of the placement, and the uses to which the finance is to be put, are announced.

Financial Analysis

23. Napp.com plc is a closely held company based Lincolnshire in B2B business offering logistic services mainly to small and medium sized companies through internet, who cannot afford sophisticated logistics practices. Company is planning to go for public issue in the coming year and is interested to know what the company's share will be worth. The company engaged a consultant based in Leicestershire. The consultant evaluated company's future prospects and made following estimates of future free cash flows.

	YEARS			
	1	2	3	4
Sales	£100,000.00	£ 115,000.00	£ 132,250.00	£ 132,250.00
Operating income (earnings before interest and taxes)	£16,000.00	£18,400.00	£21,160.00	£21,160.00
Less: Cash tax payments	(£4,800.00)	(£5,520.00)	(£6,348.00)	(£6,348.00)
Net operating profits after taxes (NOPAT)	£ 11,200.00	£ 12,880.00	£ 14,812.00	£ 14,812.00
Less: Investments:				
Investment in net working capital	(£1,695.65)	(£1,950.00)	(£2,242.50)	—

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Capital expenditures (CAPEX)	(£2,347.83)	(£2,700.00)	(£3,105.00)	—
Total investments	(£4,043.48)	(£4,650.00)	(£5,347.50)	—
Free cash flow	£ 7,156.52	£ 8,230.00	£ 9,464.50	£ 14,812.00

Further, the company's investment banker had done a study of the company's cost of capital and estimated WACC to be 12%. You are required to determine.

- (i) Value of Napp.com plc based on these estimates.
 - (ii) Market Value Added (MVA) by company supposing that invested capital in the year 0 was £ 31,304.05.
 - (iii) Value of per share, if company has 2,000 common equity share outstanding and debt amounting to £ 4,000.
24. What are the various functions of Stock Exchange?
25. What are the various techniques are used in Economic Analysis.

SUGGESTED ANSWERS/HINTS

1. (i)

	India	Malaysia	US
India	-	Rs. 1,44,38,100	(US\$ 1,06,007)
Malaysia	(Rs. 1,44,38,100)	-	MYR 1,443,800 (US\$ 80,000)
US	US\$ 1,06,007	(MYR 14,43,800) US\$ 80,000	

Table showing conversion of above position into pound sterling

	India £	Malaysia £	US £	Total £
India	-	2,12,013	(74,917)	1,37,096
Malaysia	(2,12,013)	-	1,41,341 (56,537)	(1,27,209)
US	74,917	(1,41,341) 56,537	-	(9,887)
	(1,37,096)	1,27,209	9,887	-

Decision: Central treasury department will instruct the Malaysia subsidiary to pay the Indian subsidiary £1,27,209 and the US subsidiary to pay the Indian subsidiary £9,887.

2. Here we have to compare the notional cash outflow for the forward rate of JP ¥ and the actual cash outflow involved in rupees against forward purchase of JP ¥ for dollars in Tokyo and spot purchase of dollars in Delhi for Rs.

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(A) Cash flow of forward purchasing the JP ¥

Rs. /JP ¥ 6 month forward rate

Bid rate = Bid rate of US\$ / Ask Rate of JP ¥ = Rs. 46/ JP ¥ 110.60 = Rs. 0.415913

Ask rate = Ask rate of US\$ / Bid Rate of JP ¥ = Rs. 46.03/ JP ¥ 110 = Rs. 0. 418454

Hence, Rs./JP ¥ 6 month forward rate = 0.415913/0.418454

Accordingly, if the company had purchased JP ¥ forward against rupees it would have paid = Rs.418454.50

(B) Cash flow of forward purchasing US\$ in spot market and converting into JP ¥

Amount of US dollars to be paid on due date by purchase of JP¥ 1 million in forward market

= JP¥ 1,000,000/ JP¥ 110 = US\$ 9090.91

Cash outflows in rupees against purchase of dollars in on Dec. 31, 2009 = US\$ 9090.91× Rs. 46.26 = Rs. 420,545.50

(C) Loss or gain due to strategy adopted by Mr. X.

(A) – (B) = Rs.4,18,454.50 – 4,20,545.50 = Rs. 2091.00

Thus, the company paid more Rs. 2,091.00 in the strategy adopted by Mr. X.

3. (a) Let us first calculate the Company's existing profits

	Rs.	Rs.
Sales – 20000 x SG\$500 x Rs.33		330,000,000
Variable Cost		
Imported Raw Material-20000 x €200 x Rs.56.56	226,240,000	
Manufacturing Cost- 20000 x Rs. 1,250	25,000,000	
Fixed Cost	10,000,000	261,240,000
Profit		68,760,000

After the Rupee appreciation against SG\$ and depreciation against €, the company's profitability will be

	Rs.	Rs.
Sales – 20000 x SG\$500 x Rs.32.15		321,500,000
Variable Cost		
Imported Raw Material-20000 x €200 x Rs.57.32	229,280,000	
Manufacturing Cost- 20000 x Rs. 1,250	25,000,000	
Fixed Cost	10,000,000	264,280,000
Profit		57,220,000

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Thus profit will decrease by Rs. 11,540,000 (Rs. 68,760,000 – Rs. 57,220,000)

- (b) Let the number of units that need to be sold for keeping the profits at pre appreciation level be X.

Then

$$\text{Rs. } 68,760,000 = [500 \times \text{Rs. } 32.15 \times X] - [(1250 \times X) + (200 \times 57.32X) + 10,000,000]$$

$$68,760,000 = [16075X - (1250X + 11464X + 10,000,000)]$$

$$68,760,000 + 10,000,000 = 16075X - 12714X$$

$$78,760,000 = 3361X$$

$$X = 23433.50 \text{ or, } 23434 \text{ units.}$$

Thus, the company should increase its existing supply from 20000 to 23434 to maintain the current profit level of Rs. 68,760,000.

4.

Year	2009	2010	2011	2012	2013	2014
	€	€	€	€	€	€
Investment (1)	(1,000,000)					
Working Capital	500,000	530,000	561,800	595,508	631,238	669,113
Change in WC	500,000	30,000	31,800	33,708	35,730	37,875
Sales	-	1,060,000	1,123,600	1,191,016	1,262,477	1,338,226
COGS (Material)	-	500,000	530,000	561,800	595,508	631,238
Operating Cost	-	212,000	224,720	238,203	252,495	267,645
Depreciation	200,000	200,000	200,000	200,000	200,000	-
EBT	(200,000)	148,000	168,880	191,013	214,474	439,343
Tax@34%	(68,000)	50,320	57,419	64,944	72,921	149,376
Net Income (2)	(132,000)	97,680	111,461	126,069	141,553	289,967
+ Depreciation (3)	200,000	200,000	200,000	200,000	200,000	-
+ Change in WC (4)	500,000	30,000	31,800	33,708	35,730	37,875
Cash Flow (1) + (2) + (3) – (4)	(1,432,000)	267,680	279,661	292,361	305,823	252,092
PVF	1	0.8929	0.7972	0.7118	0.6355	0.5674
Present Value	(1,432,000)	239,011	222,946	208,103	194,350	143,037

FINAL (OLD) EXAMINATION : NOVEMBER, 2010

Year	2015	2016	2017	2018	2019	NPV
	€	€	€	€	€	€
Investment (1)						
Working Capital	709,260	751,815	796,924	844,740		
Change in WC	40,147	42,556	45,109	47,816	(844,740)	
Sales	1,418,519	1,503,630	1,593,848	1,689,479	1,790,848	
COGS (Material)	669,112	709,259	751,815	796,923	844,739	
Operating Cost	283,704	300,726	318,770	337,896	358,169	
Depreciation	-	-	-	-	-	
EBT	465,703	493,645	523,263	554,660	587,940	
Tax@34%	158,339	167,839	177,909	188,584	199,899	
Net Income (2)	307,364	325,806	345,354	366,076	388,041	
+ Depreciation (3)	-	-	-	-	-	
+ Change in WC (4)	40,147	42,556	45,109	47,816	(844,740)	
Cash Flow (1) + (2) + (3) – (4)	267,217	283,250	300,245	318,260	1,232,781	
PVF	0.5066	0.4523	0.4039	0.3606	0.3220	
Present Value	135,372	128,114	121,269	114,765	396,955	471,922

Since NPV of the project is positive the project should be accepted.

5. Produce 15,000 copies initially

NPV (if review is good) (Probability 0.3)

- Rs. 4,00,000 + Rs. 5,00,000 PVAIF_{3YR., 10%} = - Rs. 4,00,000 + Rs. 5,00,000 X 2.487
= Rs. 8,43,500

NPV (if review is not good) (Probability 0.7)

Rs. - 4,00,000 + Rs. 2,00,000/1.1 = - Rs. 2,18,182

Expected net present value: 0.3 x Rs. 8,43,500 – 0.7 X Rs. 2,18,182 = Rs. 1,00,323

Produce 5,000 copies initially

NPV (if review is good) (Probability 0.3)

- Rs. 2,00,000 - Rs. 2,50,000*/1.1 + Rs. 5,00,000 PVAI_{3YR., 10%} = - Rs. 4,27,273 + Rs. 5,00,000 X 2.487 = Rs. 8,16,227

NPV (if review is not good) (Probability 0.7)

- Rs. 2,00,000 + Rs. 2,00,000/1.1 = - Rs. 2,00,000 + Rs. 1,81,818 = Rs. - 18,182

Expected net present value: 0.3 x Rs. 8,16,227 – 0.7 X Rs. 18,182 = Rs. 2,32,141

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The expected net present value is larger and the potential loss is smaller if the initial run is 5,000 copies. The 5,000 copy choice is preferred since it produces both more expected value and less risk.

* In above answer it has been assumed that to avoid again set up cost in the beginning of 2nd year 10000 copies will be printed in the end of first year.

6.

(i) (a) With Exchange Controls

Year	Profit after tax SA\$000	OJ share SA\$000	50% div SA\$000	OJ Share £000	Disc Factor @ 16%	Disc Cash flow £ 000
0				(450)	1.000	(450)
1	4,250	2,125	1,062	106	0.862	91
2	6,500	3,250	1,625	108	0.743	80
3	8,350	4,175	2,088	100	0.641	64
			4,775	227	0.641	146
Net Present Value						(69)

(b) Exchange controls removed and all earnings distributed as dividends

Year	Profit after tax SA\$000	Oj Share SA \$000	Oj Share £000	Disc Factor @16%	Disc Cash flow £000
0			(450)	(1.000)	(450)
1	4,250	2,125	212	0.862	183
2	6,500	3,250	217	0.743	161
3	8,350	4,175	199	0.641	127
Net Present Value					21

(ii) If exchange controls exist in the south American Country the project has a negative and should not be undertaken, Investing in countries with a history of high inflation and political volatility adds to the risk of the project and OJ Ltd should proceed with caution.

7. Valuation Equation

$$EVA_t = NOPAT_t - (\text{Total Invest Capital}_t \times WACC_t)$$

$$EVA_1 = \text{Rs. } 14,00,000 - (\text{Rs. } 1,00,00,000 \times 0.0842) = \text{Rs. } 5,58,000$$

$$EVA_2 = \text{Rs. } 16,00,000 - (\text{Rs. } 1,10,00,000 \times 0.0842) = \text{Rs. } 6,73,800$$

FINAL (OLD) EXAMINATION : NOVEMBER, 2010

Total Valuation Equation

$$= [\text{Rs. } 5,58,000 / (1 + 0.0842)^1] + [\text{Rs. } 6,73,800 / (1 + 0.0842)^2] + \{[\text{Rs. } 6,73,800 \times (1 + 0.065)] / (0.0842 - 0.065) / (1 + 0.0842)^2\} + \text{Rs. } 90,00,000$$

$$= \text{Rs. } 5,14,665 + \text{Rs. } 5,73,207 + \text{Rs. } 3,17,95,128 + \text{Rs. } 9,00,000$$

$$= \text{Rs. } 4,18,83,000$$

8. To find the value of A Ltd. equity shares, subtract the debt of Rs.420 lakh from the total value.

	Recession	Slow growth	Rapid growth
Value of Equity	(40)	100	300
Debt	420	420	420
Total	380	520	720

It should be noted that in above table there is a negative value of equity in recession, which is not possible because the shares have limited liability. Therefore, we will assume that the shares are zero value and the debt has declined to Rs.380 lakhs because of bankruptcy risk. Therefore the expected value of equity and debt can be calculated as follows:

	Recession Rs. Lakh	Prob.	Slow growth Rs. Lakh	Prob.	Rapid growth Rs. Lakh	Prob.	Expected Value Rs. Lakh
Value of Equity	0	0.20	100	0.50	300	0.30	140
Value of Debt	380	0.20	420	0.50	420	0.30	412
Total	380		520		720		552

To find the value of B Ltd's equity shares subtract debt of Rs.80 lakhs from the total value.

	Recession Rs. Lakh	Prob.	Slow growth Rs. Lakh	Prob.	Rapid growth Rs. Lakh	Prob.	Expected Value Rs. Lakh
Value of Equity	520	0.20	670	0.50	1070	0.30	760
Value of Debt	80	0.20	80	0.50	80	0.30	80
Total	600	0.20	750		1150		840

When the two companies merge we have to add the economic values of equity and debt together. Since the bankruptcy risk is disappeared by combining with a low geared company the negative Rs.40 lakhs also has to be used while calculating the combined firm's expected value.

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	Recession (0.20) Rs. Lakh	Slow growth (0.50) Rs. Lakh	Rapid growth (0.30) Rs. Lakh	Expected Value Rs. Lakh
Value of Equity	480	770	1370	892
Value of Debt	500	500	500	500
Total	980	1270	1870	1392

Expected Value of Equity		Expected Value of Debt	
	Rs. Lakh		Rs. Lakh
A Ltd.	140	A Ltd.	412
B Ltd.	760	B Ltd.	80
Total	900	Total	492
Combined firm loss in equity capital	8	Increase in debt	8

After the combination, in the absence of synergy, the total economic value of the business remains at Rs.1392 lakhs but the expected value of debt has increased by Rs. 8 lakhs at the expense of equity. Because, under the recession there is no longer a bankruptcy risk for the debt holders of A Ltd.

The cash flows of the combined company may reduce in volatility because of the portfolio effect and this may further reduce the cost of debt, increasing its value.

9. Assumption: Though in the question it is assumed that there is no operating synergy and so no increase on the combined earnings; it is unlikely a bid would be launched if substantial synergy was not estimated.

Share for share offer

	AB Ltd.	YZ Ltd.	Combined
Profit before tax (Rs. lakh)	1,266.00	1,125.00	2,391.00
Less: Tax @ 30%	379.80	337.50	717.30
Profit after Tax	886.20	787.50	1,673.70
Number of shares (lakh)	25.00	18.00	40.00
Earnings Per Share (Rs.)	35.45	43.75	41.84
P/E ratio	11	7	
Share price (pre bid) (Rs.)	389.95	306.25	381.53*
Market Value of company (Rs. lakh)	9,748.75	5,512.50	15,261.25
* $\frac{\text{Rs. 15,261.25 lakh}}{40 \text{ lakh}} = \text{Rs. 381.53}$			

FINAL (OLD) EXAMINATION : NOVEMBER, 2010

Post Bid Price (Combined Entity)

Rs. 41.84 X 11 = Rs. 460 per share

Share for Cash offer

Rs. 460 per share

Thus cash offer is more beneficial for AB Ltd.

Reasons (partially) for the fall in the market price of the shares in the market

Wealth of a shareholder of YZ Ltd. holding 6 shares in YZ Ltd. (Rs.306.25 X 6)
Rs. 1,837.50

Wealth of a shareholder of YZ Ltd. holding 5 shares in combined entity (Rs.381.53 X 5)
Rs. 1,907.65

Thus there seems to be transfer of wealth from the AB Ltd. to YZ Ltd.

Value of shares using the Dividend Growth Model

$$AB = \frac{(35.45 \times 1.04)}{(0.13 - 0.04)} = \text{Rs. } 409.64$$

$$YZ = \frac{(43.75 \times 1.04)}{(0.11 - 0.04)} = \text{Rs. } 650.00$$

This would suggest that AB is slightly undervalued, but that YZ is hugely undervalued in the marketplace. It is possible that the market does not believe YZ's growth estimates, given its poor performance to date.

10. Cornett, GMBH. – Break-up valuation

Business Segment	Capital-to- Sales	Segment Sales	Theoretical Values
Consumer wholesale	0.75	€1,500,000	€1,125,000
Specialty services	1.10	€800,000	€880,000
Assorted centers	1.00	€2,000,000	<u>€2,000,000</u>
Total value			<u>€4,005,000</u>

Business Segment	Capital-to- Assets	Segment Assets	Theoretical Values
Consumer Wholesale	0.60	€750,000	€450,000
Specialty services	0.90	€700,000	€630,000
Assorted centers	0.60	€3,000,000	<u>€1,800,000</u>
Total value			<u>€2,880,000</u>

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Business Segment	Capital-to-Op.Income	Segment Income	Theoretical Values
Consumer wholesale	10.00	€100,000	€1,000,000
Specialty services	7.00	€150,000	€1,050,000
Assorted centers	6.00	€600,000	<u>€3,600,000</u>
Total value			<u>€5,650,000</u>

$$\text{Average theoretical value} = \frac{4,005,000 + 2,880,000 + 5,650,000}{3} = 4,178,333.33 \text{ say } 4,178,000$$

Average theoretical value of Cornett GMBH. = €4,178,000

11. i. Computation of tax rate

EBIT	= 245 lakh
Interest	= 218.125 lakh
PBT	= 26.875 lakh
PAT	= 17.2 lakh
Tax paid	= 9.675 lakh
Tax rate	= 9.675 / 26.875 = 0.36 = 36%

ii. Computation for increase in working capital

Working capital (2009)	= 44 lakh
Increase in 2010	= 44 X 0.08 = 3.52 lakh
It will continue to increase @ 8% per annum.	

iii. Weighted average cost of capital

Present debt	= 1934 lakh
Interest cost	= 218.125 lakh / 1934 lakh = 11.28 %
Equity capital	= 75 lakh X Rs. 66 = 4950 lakh

$$K_c = \frac{4950}{1934 + 4950} \times 16\% + \frac{1934}{1934 + 4950} \times 11.28 (1 - 0.36)$$

$$= 11.51 + 2.028 = 13.54$$

iv. As capital expenditure and depreciation are equal, they will not influence the free cash flows of the company.

FINAL (OLD) EXAMINATION : NOVEMBER, 2010

v. Computation of free cash flows upto 2012

Year	2010	2011	2012	2013	2014
EBIT (1-t) (1)	169.344 lakh	182.89 lakh	197.52 lakh	213.32 lakh	230.39 lakh
Increase in working capital (2)	3.52 lakh	3.80 lakh	4.11 lakh	4.43 lakh	4.79 lakh
Debt repayment (3)	-	-	-	-	1934 × 0.30 = 580.2 lakh
Free cash flows (1) – (2) – (3)	165.824 lakh	179.09 lakh	193.41 lakh	208.89 lakh	-354.6 lakh
PVF @ 13.54%	0.8807	0.7757	0.6832	0.6017	0.53
PV of free cash flow @ 13.54%	146.04 lakh	138.90 lakh	132.13 lakh	125.69 lakh	-187.94 lakh

Present value of free cash flows upto 2014 = 354.82 lakh

vi. Cost of capital

Debt = 0.7 X 1934 = 1353.8 lakh

Equity = 4950 lakh

$$K_c = \frac{4950}{4950 + 1353.8} \times 16\% + \frac{1353.8}{4950 + 1353.8} \times 11.28 (1 - 0.36) = 14.11\%$$

viii. Continuing value

$$\frac{240.336}{0.1411 - 0.06} \times (1/1.1354)^5$$

= Rs. 1,570.56 lakh

Value of the firm = PV of free cash flows upto 2014 + continuing value – Market value of outstanding debt

= Rs. 354.82 lakh + Rs. 1,570.56 – Rs. 1,353.80

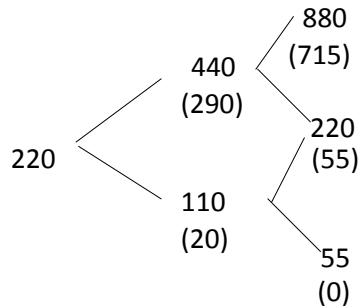
= Rs. 571.58 lakh

b) Value per share = Rs. 571.58 lakh / 75 lakh = Rs. 7.62 < Rs. 66 (present market price)

Therefore, the share price is overvalued in the market.

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12. The possible prices of X Ltd.'s share and the associated call option values shown below:



- a. Let p is the probability of a rise in the stock price. Then, if investors are risk-neutral:

$$p(1.00) + (1 - p)(-0.50) = 0.10$$

$$p = 0.4$$

If the stock price in month 6 is Rs.110, then the option will not be exercised. So expected value of call option is:

$$[(0.4 \times \text{Rs.}55) + (0.6 \times \text{Rs.}0)]$$

And its worth to be

$$[(0.4 \times \text{Rs.}55) + (0.6 \times \text{Rs.}0)]/1.10 = \text{Rs.}20$$

Similarly, if the stock price is Rs.440 in month 6, then, if it is exercised. The expected value of call option is

$$[(0.4 \times \text{Rs.}715) + (0.6 \times \text{Rs.}55)]$$

And it will be worth

$$[(0.4 \times \text{Rs.}715) + (0.6 \times \text{Rs.}55)]/1.10 = \text{Rs.}290$$

Value of call today is:

$$[(0.4 \times \text{Rs.}290) + (0.6 \times \text{Rs.}20)]/1.10 = \text{Rs.}116.36$$

- b. (i) If the price rises to Rs.440:

$$\text{Delta} = \frac{\text{Rs.}715 - \text{Rs.}55}{\text{Rs.}880 - \text{Rs.}220} = 1.0$$

- (ii) If the price falls to Rs.110:

$$\text{Delta} = \frac{\text{Rs.}55 - 0}{\text{Rs.}220 - \text{Rs.}55} = 0.33$$

- c. If the stock price is Rs.110 at 6 months, the option delta is 0.33. Therefore, in order to replicate the stock, we buy three calls and lend, as follows:

FINAL (OLD) EXAMINATION : NOVEMBER, 2010

	Initial Outlay	Stock Price = 55	Stock Price = 220
Buy 3 calls	-60	0	165
Lend PV(55)	<u>-50</u>	+55	+55
	-110	+55	+220

This strategy is equivalent to:

Buy stock	-110	+55	+220
-----------	------	-----	------

13. (a) Expected EPS for next years.

$$EPS_1 = €10 (1+0.20) = €12$$

$$EPS_2 = €12 (1+0.20) = €14.40$$

$$EPS_3 = €14.40 (1+0.20) = €17.28$$

$$EPS_4 = €17.28 (1+0.20) = €20.736$$

$$EPS_5 = €20.736 (1+0.20) = €24.88$$

$$EPS_6 = €24.88 (1+0.15) = €28.61$$

$$\text{Thus } D_6 = 0.40 (€28.61) = €11.44$$

$$\text{Hence, value of DESC's share 5 years from now} = \frac{D_6}{r-g} = \frac{€11.44}{15\% - 9\%} = €191$$

$$\text{So value of DESC's share today is } \frac{€191}{1.15^5} = €94.96$$

- (b) The price should rise by 15% per year until year 6. Since there is no capital gain, the entire return must be in capital gains.
- (c) There will be no effect as ROE = r i.e. the value of DESC's share 5 years from now.

$$= \frac{D_6}{r-g} = \frac{€5.722}{15\% - 12\%} = €191$$

14.

$$(a) P_0 = \frac{D_1}{K_e - g}$$

$$£73 = \frac{£1.68}{K_e - 0.085} = 0.1080$$

$$K_e = 10.8\%$$

- (b) Retained Earnings = 0.50 = b

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Thus $g = b.r = 0.50 \times 12\% = 6\%$

According K_e would be.

$$\text{£}73 = \frac{\text{£}1.68}{K_e - 0.06} = 0.083$$

$$K_e = 8.30\%$$

15. (a) Return for the year (all changes on a per unit basis):

Change in Price (Rs.9.10-Rs. 8.50)	Rs. 0.60
Dividends received	Rs. 0.90
Capital gains distributions	<u>Rs. 0.75</u>
Total return	<u>Rs. 2.25</u>
Holding period return =	$\frac{\text{Rs. 2.25}}{\text{Rs. 8.50}} = 26.47\%$

- (b) When all dividends and capital gains distributions are reinvested into additional units of the fund (Rs. 8.75/unit):

Dividends and capital gains per unit:	Rs. 0.90 + Rs. 0.75 = Rs. 1.65
Total amount received from 200 units:	Rs. 1.65 X 200 = Rs. 330.00
Additional units added:	Rs. 330/Rs. 8.75 = 37.7 units
Value of 237.7 units held at end of year:	237.7 units X Rs. 9.10 = Rs. 2,163
Price paid for 200 units at beginning of year	200 units X Rs. 8.50 = Rs. 1,700
Thus, the Holding Period Return would be:	

$$= \frac{(\text{No. of units at end of Period} \times \text{Ending Price}) - (\text{No. of units at beginning of Period} \times \text{Initial Price})}{\text{No. of units at beginning of Period} \times \text{Initial Price}}$$

$$\text{H.P.R.} = \frac{\text{Rs. 2,163} - \text{Rs. 1,700}}{\text{Rs. 1,700}} = \frac{\text{Rs. 463}}{\text{Rs. 1,700}} = 27.24\%$$

16. Working Notes:

- (1) Calculation of average of these four variables

Year	Tomplan Mutual Fund Beta	Tomplan Mutual Fund return %	Return on market index %	Return on Govt. securities %
2001	0.90	-3.00	-8.50	6.50
2002	0.95	1.50	4.00	6.50
2003	0.95	18.00	14.00	6.00

FINAL (OLD) EXAMINATION : NOVEMBER, 2010

2004	1.00	22.00	18.50	6.00
2005	1.00	10.00	5.70	5.75
2006	0.90	7.00	1.20	5.75
2007	0.80	18.00	16.00	6.00
2008	0.75	24.00	18.00	5.50
2009	0.75	15.00	10.00	5.50
2010	0.70	-2.00	8.00	6.00
Total	8.7	110.5	86.9	59.5
Average	0.87	11.05	8.69	5.95

Thus, the averages are as follows:

Mutual fund beta = 0.87

Mutual fund return = 11.05 per cent

Return on market index = 8.69 per cent

Return on Govt. securities = 5.95 per cent

(2) Standard deviation of returns of Tomplan Mutual fund

Year	Mutual fund returns (X)	X ²
1	-3.00	9.00
2	1.50	2.25
3	18.00	324.00
4	22.00	484.00
5	10.00	100.00
6	7.00	49.00
7	18.00	324.00
8	24.00	576.00
9	15.00	225.00
10	-2.00	4.00
Total	110.50	2097.25

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$$\begin{aligned}\sigma_p &= \sqrt{\frac{N\sum X^2 - (\sum X)^2}{N^2}} \\ &= \sqrt{\frac{(10 \times 2097.25) - (110.5)^2}{10 \times 10}} \\ &= \sqrt{\frac{20972.50 - 12210.25}{100}} \\ &= \sqrt{87.62} = 9.36 \text{ per cent}\end{aligned}$$

(3) Standard deviation of returns on the market index

Year	Return on market index (X)	X ²
1	-8.50	72.25
2	4.00	16.00
3	14.00	196.00
4	18.50	342.25
5	5.70	32.49
6	1.20	1.44
7	16.00	256.00
8	18.00	324.00
9	10.00	100.00
10	<u>8.00</u>	<u>64.00</u>
Total	<u>86.90</u>	<u>1404.43</u>

$$\begin{aligned}\sigma_m &= \sqrt{\frac{N\sum X^2 - (\sum X)^2}{N^2}} \\ &= \sqrt{\frac{(10 \times 1404.43) - (86.90)^2}{10 \times 10}} \\ &= \sqrt{\frac{14,044.30 - 7551.61}{100}} \\ &= \sqrt{64.93} \\ &= 8.06\end{aligned}$$

FINAL (OLD) EXAMINATION : NOVEMBER, 2010

- (a) (i) *Reward to variability ratio or Sharpe ratio*

For Tomplan Mutual Fund

$$SR = \frac{r_p - r_f}{\sigma_p}$$

$$SR = \frac{11.05 - 5.95}{9.36} = 0.545$$

For Market

$$SR = \frac{r_m - r_f}{\sigma_m}$$

$$SR = \frac{8.69 - 5.95}{8.06} = 0.34$$

- (ii) *Reward to volatility ratio or Treynor ratio*

For Tomplan Mutual Fund

$$TR = \frac{r_p - r_f}{\beta_p}$$
$$= \frac{11.05 - 5.95}{0.87} = 5.86$$

For Market

$$TR = \frac{r_m - r_f}{\beta_m}$$
$$= \frac{8.69 - 5.95}{1} = 2.74$$

- (b) *Mutual fund performance*

Ratios of the mutual fund and the market is as follows:

Ratio	Mutual fund	Market index
Sharpe ratio	0.545	0.34
Treynor ratio	5.86	2.74

Thus from above it is clear that the Tomplan Mutual fund has performed better than the market.

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17. (a) Let Equated annual lease rentals be X

Then, $X = \text{Investment Cost} / \text{PVIFA} (24\%, 5)$

$$X = \$5 \text{ Million} / 2.745$$

$$X = \$5,000,000 / 2.745$$

$$X = \$1,821,500 \text{ (Equated annual lease rentals)}$$

- (b) Let Stepped lease rental (assuming annual increase of 15 per cent annually) be X:

Then, $X \times \text{PVIF}(24\%, 1) + (1.15)X \times \text{PVIF}(24\%, 2) + (1.15)^2X \times \text{PVIF}(24\%, 3) + (1.15)^3X \times \text{PVIF}(24\%, 4) + (1.15)^4X \times \text{PVIF}(24\%, 5) = \5 Million

$$\text{i.e. } 0.806X + 0.7475X + 0.693X + 0.6433X + 0.5964X = \$5 \text{ Million}$$

$$3.4862X = \$5 \text{ Million}$$

$$X = \$5 \text{ Million} / 3.4862 = \$1,434,226$$

Lease rentals (year-wise)

Year	1	2	3	4	5
Lease rent	\$1,434,226	\$1,649,360	\$1,896,760	\$2,181,280	\$2,508,470

- (c) Deferred lease rental (deferment of 2 Years)

Denoting X as the equated annual rental to be charged between Years 3–5,

$$X \times \text{PVIF} (24\%, 3) + X \times \text{PVIF} (24\%, 4) + X \times \text{PVIF} (24\%, 5) = \$5 \text{ million}$$

$$0.524 X + 0.423 X + 0.341X = \$5 \text{ million}$$

$$X = \$5 \text{ million} / 1.288 = \$ 3.882 \text{ million i.e. } \$3,882,000$$

18. The parameters are $E(R) = 15$, $\sigma = 60$, and the correlation between any pair of stocks is $\rho = .5$.

- a. The portfolio expected return is invariant to the size of the portfolio because all stocks have identical expected returns. The standard deviation of a portfolio with n = 25 stock is

$$\sigma_p = \left[\sigma^2 / n + \rho \times \sigma^2 (n - 1) / n \right]^{1/2}$$

$$= \left[60^2 / 25 + 0.5 \times 60^2 \times 24 / 25 \right]^{1/2} = 43.27$$

- b. Because the stocks are identical, efficient portfolios are equally weighted. To obtain a standard deviation of 43%, we need to solve for n:

FINAL (OLD) EXAMINATION : NOVEMBER, 2010

$$43^2 = \frac{60^2}{n} + 0.5 \times \frac{60^2(n-1)}{n}$$

$$1,849n = 3,600 + 1,800n - 1,800$$

$$n = \frac{1,800}{49} = 36.73$$

Thus we need 37 stock and will come in with volatility slightly under the target.

- c. As n gets very large, the variance of an efficient (equally weighted) portfolio diminishes, leaving only the variance that comes from the covariances among stocks, that is

$$\sigma_p = \sqrt{\rho \times \sigma^2} = \sqrt{0.5 \times 60^2} = 42.43$$

- d. If the risk-free is 10%, then the risk premium on any size portfolio is 15% - 10% = 5%. The standard deviation of a well-diversified portfolio is (practically) 42.43%; hence the slope of the Capital Allocation Line (CAL) is

$$S = 5/42.43 = 0.1178$$

19. (a) (i) Current market price of shares already in issue:

$$\begin{aligned} \text{Earnings per share} &= \frac{\text{Rs. } 75,00,000}{4,00,000} \\ &= \text{Rs. } 18.75 \end{aligned}$$

$$\begin{aligned} \text{P/E ratio} &= \frac{\text{Market price per share}}{\text{Earnings per share}} \\ &= 8 \end{aligned}$$

$$\begin{aligned} \text{Market price per share} &= 8 \times \text{Rs. } 18.75 \\ &= \text{Rs. } 150 \end{aligned}$$

- (ii) Price at which rights issue will be made:

$$\text{Rs. } 150 \times 75\% = \text{Rs. } 112.50$$

- (iii) Number of new shares that will be issued:

$$\frac{\text{Rs. } 2,02,50,000}{\text{Rs. } 112.50} = 180,000 \text{ shares}$$

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(iv) Ex-rights price is

$$\begin{aligned} & \text{Rs. } 150 \times \frac{4,00,000}{5,80,000} + \text{Rs. } 112.50 \times \frac{1,80,000}{5,80,000} \times \frac{15\%}{12.5\% *} \\ &= \text{Rs. } 103.44 + \text{Rs. } 41.90 \\ &= \text{Rs. } 145.34 \end{aligned}$$

* The price/earnings ratio is given as 8. This would imply an earnings yield of $(1 \div 8) = 12.5\%$. This is assumed to be the yield or rate of return on existing funds.

(b) Assume that a shareholder holds 20 shares, the rights issue means addition of another 9 shares. Theoretical, the selling price of the right to purchase one share will be (Rs. 145.34 – Rs. 112.50), that is Rs. 32.84. Let us discuss the two cases first if he opt for taking the right and second if he does not taking the right but selling it.

(i) Taking up the rights:

	Rs.
Market value of 29 shares at ₹145.34 each	4,214.86
Less: Cost of taking up rights of nine new shares at Rs. 112.50 each	<u>1,012.50</u>
	<u>3,202.36</u>

(ii) Selling the rights:

	Rs.
Market value of 20 shares at ₹145.34 each	2,906.80
Add: Sale of 9 rights at Rs. 32.84 each	<u>295.56</u>
	<u>3,202.36</u>

20. As per the conversion terms 1 Debenture = 20 equity share (known as the conversion ratio.)

The conversion terms can also be expressed as: 1 Debenture of Rs. 500 = 1 equity share.

(i) The conversion premium measures how much more expensive it is to buy the convertible debenture than the underlying equity share.

(ii) The cost of buying Rs. 500 debenture (one equity share) is:

$$\text{Rs. } 500 \times \frac{108}{100} = \text{Rs. } 540$$

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Comparing this with the cost of buying one equity share from market at Rs.480.

Thus, conversion premium is therefore:

$$\frac{540 - 480}{480} \times 100 = 12.5\%$$

Therefore, it is more expensive to buy the debenture and get it converted, than to purchase one equity share directly.

- (iii) The *conversion value* is calculated as the market value of equity shares that is equivalent to one unit of the convertible debenture.

$$\begin{aligned}\text{Conversion value} &= \text{conversion ratio} \times \text{MPS (equity shares)} \\ &= 20 \times \text{Rs. } 480 \\ &= \text{Rs. } 9,600\end{aligned}$$

From this calculation of conversion value, the conversion premium may also be calculated as below:

$$\frac{\text{Rs. } 10800 - \text{Rs. } 9600}{\text{Rs. } 9600} \times 100 = 12.5\%$$

21. (i) The discount bond prices are as follows:

Term	Rate%	Discount Bond Price
90 days	7.00	$B_0(90) = 1/(1 + 0.07(90/360)) = 0.9828$
180 days	7.25	$B_0(180) = 1/(1 + 0.0725(180/360)) = 0.9650$
270 days	7.45	$B_0(270) = 1/(1 + 0.0745(270/360)) = 0.9471$
360 days	7.55	$B_0(360) = 1/(1 + 0.0755(360/360)) = 0.9298$

The fixed rate is

$$\frac{1 - 0.9298}{0.9828 + 0.9650 + 0.9471 + 0.9298} \times \frac{360}{90} = 0.0734$$

- (ii) The first net payment is based on a fixed rate of 7.34 percent and a floating rate of 7 percent:

$$\text{Fixed payment: } €35,00,000(0.0734)(90/360) = €64,225$$

$$\text{Floating payment: } €35,00,000(0.07)(90/360) = €61,250$$

The net is that the party paying fixed makes a payment of €2,975

22. It is well known that in a semi-strong market the share price should accurately reflect new relevant information when it becomes publicly available. This would include the effect on Denter of the expansion scheme and the redemption of the term Bonds.

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	\$m	\$m	\$m
The existing market value is 190¢ X 32m shares			60.8
The new investment has an expected NPV of \$1.1m, which will add to market value		1.1	
The proceeds of the issue will add to market value		<u>15.0</u>	16.1
Issue costs of 4% would reduce market value			(0.6)
Expected present value of outflows before redemption is announced			
Interest £750,000 per year (\$5m X 15%) X 3.791	2.843		
PV of repayment in year 5 \$5m X 0.621	<u>3.105</u>	5.948	
Redemption cost now	(5.000)		
Penalty charge	<u>(0.350)</u>	(5.350)	
Present value benefit from early redemption			<u>0.598</u>
Expected total market value			<u>76.898</u>

23. (i) Terminal value = $\frac{\text{£ } 14,812}{0.12} = \text{£ } 1,23,433.33$

Value of the Company = PV of free cash flows =

$$\frac{\text{£ } 7,156.52}{(1.12)^1} + \frac{\text{£ } 8,230.00}{(1.12)^2} + \frac{\text{£ } 9,464.50}{(1.12)^3} + \frac{\text{£ } 123,433.33}{(1.12)^3}$$

$$= \text{£ } 107,544.71$$

(ii) MVA = Company value – Invested capital

$$= \text{£ } 107,544.71 - \text{£ } 31,304.05$$

$$= \text{£ } 76,240.66$$

(iii) Company's value = Debt value + Equity value

$$\text{£ } 107,544.71 = \text{£ } 4,000 + \text{Equity value}$$

$$\text{Equity Value} = \text{£ } 103,544.71$$

Value of per share = $\frac{\text{Equity Value}}{\text{Shares Outstanding}}$

$$= \frac{\text{£ } 103,544.71}{2,000} = \text{£ } 51.77$$

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24. The Stock Exchange is a market place where investors buy and sell securities. Functions of the stock exchanges can be summarized as follows:

- (a) Liquidity and Marketability of Securities:** The basic function of the stock market is the creation of a continuous market for securities, enabling them to be liquidated, where investors can convert their securities into cash at any time at the prevailing market price.

It also provides investors the opportunity to change their portfolio as and when they want to change, i.e. they can at any time sell one security and purchase another, thus giving them marketability.

- (b) Fair Price Determination:** This market is almost a perfectly competitive market as there are large number of buyers and sellers. Due to nearly perfect information, active bidding take place from both sides. This ensures the fair price to be determined by demand and supply forces.

- (c) Source for Long term Funds:** Corporates, Government and public bodies raise funds from the equity market. These securities are negotiable and transferable. They are traded and change hands from one investor to the other without affecting the long-term availability of funds to the issuing companies.

- (d) Helps in Capital Formation:** There is the nexus between the savings and the investments of the community. The savings of the community are mobilized and channeled by stock exchanges for investment into those sectors and units which are favoured by the community at large, on the basis of such criteria as good return, appreciation of capital, and so on. It is the preference of investors for individual units as well as industry groups, which is reflected in the share price, which decides the mode of investment. Stock exchanges render this service by arranging for the preliminary distribution of new issues of capital, offered through prospectus, as also offers for sale of existing securities, in an orderly and systematic manner. They themselves administer the same, by ensuring that the various requisites of listing (such as offering at least the prescribed minimum percentage of capital to the public, keeping the subscription list open for a minimum period of days, making provision for receiving applications at least at the prescribed centres, allotting the shares against applications on a fair and unconditional basis) are duly complied with.

Members of stock exchanges also assist in the flotation of new issues by acting (i) as brokers, in which capacity they, *inter alia*, try to procure subscription from investors spread all over the country, and (ii) as underwriters.

Stock exchanges also provide a forum for trading in rights shares of companies already listed, thereby enabling a new class of investors to take up a part of the rights in the place of existing shareholders who renounce their rights for monetary considerations.

- (e) Reflects the General State of Economy:** The performance of the stock markets reflects the boom and depression in the economy. It indicates the general state of

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the economy to all those concerned, who can take suitable steps in time. The Government takes suitable monetary and fiscal steps depending upon the state of the economy.

25. Economic analysis is used to forecast national income with its various components that have a bearing on the concerned industry and the company in particular. Gross national product (GNP) is used to measure national income as it reflects the growth rate in economic activities and has been regarded as a forecasting tool for analyzing the overall economy along with its various components during a particular period.

Some of the techniques used for economic analysis are:

- (a) **Anticipatory Surveys:** They help investors to form an opinion about the future state of the economy. It incorporates expert opinion on construction activities, expenditure on plant and machinery, levels of inventory – all having a definite bearing on economic activities. Also future spending habits of consumers are taken into account.

In spite of valuable inputs available through this method, it has certain drawbacks:

- (i) Survey results do not guarantee that intentions surveyed would materialize.
- (ii) They are not regarded as forecasts per se, as there can be a consensus approach by the investor for exercising his opinion.

Continuous monitoring of this practice is called for to make this technique popular.

- (b) **Barometer/Indicator Approach:** Various indicators are used to find out how the economy shall perform in the future. The indicators have been classified as under:

- (i) **Leading Indicators:** They lead the economic activity in terms of their outcome. They relate to the time series data of the variables that reach high/low points in advance of economic activity.
- (ii) **Roughly Coincidental Indicators:** They reach their peaks and troughs at approximately the same in the economy.
- (iii) **Lagging Indicators:** They are time series data of variables that lag behind in their consequences vis-a- vis the economy. They reach their turning points after the economy has reached its own already.

All these approaches suggest direction of change in the aggregate economic activity but nothing about its magnitude. The various measures obtained from such indicators may give conflicting signals about the future direction of the economy. To avoid this limitation, use of diffusion/composite index is suggested whereby combining several indicators into one index to measure the strength/weaknesses in the movement of a particular set of indicators. Computation of diffusion indices is no doubt difficult notwithstanding the fact it does not eliminate irregular movements.

Money supply in the economy also affects investment decisions. Rate of change in money supply in the economy affects GNP, corporate profits, interest rates and stock prices. Increase in money supply fuels inflation. As investment in stocks is

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considered as a hedge against inflation, stock prices go up during inflationary period.

(c) Economic Model Building Approach: In this approach, a precise and clear relationship between dependent and independent variables is determined. GNP model building or sectoral analysis is used in practice through the use of national accounting framework. The steps used are as follows:

- (i) Hypothesize total economic demand by measuring total income (GNP) based on political stability, rate of inflation, changes in economic levels.
- (ii) Forecasting the GNP by estimating levels of various components viz. consumption expenditure, gross private domestic investment, government purchases of goods/services, net exports.
- (iii) After forecasting individual components of GNP, add them up to obtain the forecasted GNP.
- (iv) Comparison is made of total GNP thus arrived at with that from an independent agency for the forecast of GNP and then the overall forecast is tested for consistency. This is carried out for ensuring that both the total forecast and the component wise forecast fit together in a reasonable manner.